THE EFFECTIVENESS OF MINDMAPPING TO TEACH WRITING SKILL VIEWED FROM THEIR IQ

(An Experimental Study in the Seventh Grade Students of SMPN 1 Prambon in the Academic Year 2009/2010)

By

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Submitted to Graduate School of Sebelas Maret University as a Partial Fulfillment for Getting Graduate Degree in English Education

ENGLISH EDUCATION DEPARTMENT

GRADUATE SCHOOL

SEBELAS MARET UNIVERSITY

SURAKARTA

2010

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MOTTO

Keep trying to do our best
is
the best way to live our life.

DEDICATION

My proud parents and parents-in-law

My beloved wife, Dwi Ariningsih, who always encourages me

My star, moon, and sun, who always give guidance towards home

My brothers and sisters

My friends in the world here and after

ABSTRACT

ADI SUYANTO, S890208101, 2010. *The Effectiveness of Mindmapping to Teach Writing Skill Viewed from Their IQ* (An Experimental Study on the Seventh Grade Students of SMPN 1 Prambon in the Academic Year 2009/2010). Thesis. Surakarta. English Education Department of Graduate School, Sebelas Maret University of Surakarta. 2010.

The objectives of the research are: (1) to know whether the mindmapping technique is more effective than the modeling technique in teaching writing for the seventh grade students of SMPN 1 Prambon in the academic year 2009/2010; (2) to know whether the writing skill of the students having high IQ is better than that of those having low IQ in learning English; and (3) to know whether there is an interaction between teaching techniques and students IQ in teaching writing for the seventh grade students of SMPN 1 Prambon in the academic year 2009/2010.

The research was carried out at SMPN 1 Prambon Nganjuk East Java, from July 2009 to August 2009. The research method was experimental. The subject of the research is the students of the seventh grade 8 and the seventh grade 9. Each of them consists of 36 students. There are 14 boys and 22 girls in the seventh eight and there are 10 boys and 26 girls in the seventh nine. The seventh nine is as experimental class which was taught using mindmapping technique and the seventh eight is as control class which was taught using modeling technique. The data were in the form of quantitative data and they were taken from a test. They are the scores of students' writing test after having nine times treatment for each class. The researcher analyzed the data using ANOVA or analysis of variance and Tukey test.

Based on the result of data analysis, the research findings are: (1) The mindmapping technique is more effective than modeling technique to teach writing for the seventh grade students of junior high school; (2) The writing skill achievement of the students having high IQ is better than that of those having low IQ; and (3) There is an interaction between teaching techniques and students' IQ. Based on these research findings, it can be concluded that mindmapping technique is an effective technique to improve the writing skill of the seventh grade students of SMPN 1 Prambon, Nganjuk.

The research result of this study implies that: (1) English teachers are suggested to use mindmapping technique to teach writing; (2) the students could use mindmapping to improve their writing ability as it can help them to generate, elaborate, and organize their ideas; and (3) the future researchers are expected to develop some dimensions which have not been developed in this research such as using different students' population or students' condition viewed from the students' motivation or social economic background.

PRONOUNCEMENT

This is to certify that I myself write this thesis entitled **"The Effectiveness of Mindmapping to Teach Writing Skill Viewed from Their IQ (An Experimental Study in the Seventh Grade Students of SMPN 1 Prambon in the Academic Year 2009/2010)".** It is not a plagiarism or made by others. Anything related to others' works is written in quotation, the sources of which are listed on the list of references.

If then the pronouncement proves wrong, I am ready to accept any academic punishment, including the withdrawal or cancellation of my academic degree.

Surakarta, February 2010

Adi Suyanto

ACKNOWLEDGEMENT

In the name of Allah, the Almighty and Merciful. Praise is only to Allah, for all His abundant blessing, mercies, and guidance, so that the writer is able to complete this thesis writing.

The writer is fully aware that this thesis cannot be finished without other people's help. Therefore, in this opportunity he would like to express her deep gratitude to the following people:

1. The Director of Graduate School of Sebelas Maret University for giving the chance and facilities so that the writer can study in the university.
2. Dr. Ngadiso, M.Pd. as the Head of the English Education Department of Graduate School and also as the first consultant, who has given his support, suggestions, criticism, guidance, and motivation for writing this thesis. He has done so much to help the writer finish this thesis.
3. Dr. Abdul Asib, M.Pd as the second consultant, for his valuable guidance, advice, and feedback in writing the thesis. Thanks a lot for the spending time and energy to revise the researcher's thesis.
4. The Principal of SMPN 1 Prambon Nganjuk, for his permission to the writer to study at the English Education of Graduate School of Sebelas Maret University and also his permission to conduct research at the school.
5. His beloved parents, parents-in-law, brothers, and sisters by whom the writer has been supported for their prayer.
6. His beloved wife and three daughters who are never tired giving material, psychological and spiritual support so that he is able to finish this thesis.

Finally the writer realizes that this thesis is still far from being perfect. Therefore, constructive suggestion is needed for the progress of the next study. The writer hopes that this research will give an important contribution to the development of English education. May God always bless us and lead us in his right path. Amin.

Surakarta, February 2010

A.S.

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CHAPTER I

INTRODUCTION

A. Background of the Study

Developing communicative competence is the main objective of the teaching English in Indonesia. Content Standard, one of the eight National Educational Standards, states that one of the objectives of teaching English as a foreign language in Indonesia is to develop communicative competence in oral and written form in the target language. The Content Standard also regulates students to attain functional literacy level which is a level where the students are able to use language to fulfill their daily needs such as reading newspaper, manual, or instructions. To achieve the objectives, the teaching of English in Indonesia is directed to develop students' competence in four language skills; they are listening, speaking, reading, and writing skills.

Among the four language skills mentioned above, writing skill is one of the two skills which are tested in the final evaluation. Therefore, it can be assumed that writing skill is one of the most important skills in the teaching of English in Indonesia.

Furthermore, writing is also important because it can accelerate students in the process of learning the target language**.** Byrne (1997: 6) states that in the early stages of a course towards oral proficiency, writing serves a variety of pedagogical purposes. The consideration strongly suggests that during early

course where teaching still concentrates on aural-oral skills, teachers can make good use of writing as part of an integrated skills approach to language learning.

Even though writing skill is important, still it does not get enough attention and proper time allocation in the teaching and learning process. Byrne in Matthews, et al. (1985: 89) mentions that most teachers consider that class time should be almost entirely devoted for developing oral skill except for few exceptions, such as activities closely linked to some forms of oral work. Therefore, writing activity is given to the students as an out-of-class activity which is done in the students own pace and mostly without clear and specific instructions from the teacher. Though, it is sometimes reasonable because the time is short; thus this also serves to increase the amount of language contact time.

Lack of teachers' monitor on the process of the students' writing activity causes a lot of problems in the students writing skill. If the researcher looks at the students' written work, he normally finds that there are some inadequacies in their work. Some of the errors may point to unfamiliarity with the language itself. The unfamiliarity with the language leads to errors in lexical and grammatical features. Another problem is closely related to the medium rather than the language such as problems of organizing information, punctuation, and spelling. A study conducted by Supriyanto (2008: 2) indicates that students' writing skill was still low. The students made a lot of grammatical, spelling, and punctuations mistakes. They got difficulties in "finding" their own ideas. They also got difficulties in expressing those ideas and organize them logically. The students were not capable of developing good paragraphs.

Unfortunately most of the problems above also occur in SMPN 1 Prambon. The strategies applied by the teacher at the school do not seem to be effective since they do not give much contribution in developing the students' writing ability. Students, mostly, have problems in organizing the ideas to become a well organized written work. Students, even the ones with high intelligence, cannot compose a well organized written work although they have mastered the language components, such as vocabulary and grammar of the language. At the same time, students with low intelligence have to use most of their time struggling with the language components. Lack of clear and specific instructions and also lack of control and monitor from the teacher during the writing process hinder the students from getting the appropriate writing skill needed to fulfill their daily communication need, whereas the scope of teaching of English in the junior high school is to develop competence in understanding and producing oral and written text in functional literacy level.

To cope with the problem above, the researcher proposes the use of mind mapping in the teaching of writing skill on the consideration that it can facilitate the teacher to monitor the process of the students writing activities. Mind mapping, different from note taking and note making which are conventional outlining, is an outlining technique developed based on the way how the brain works. It uses not only verbal description but also picture and symbol (Deporter, 2005: 152). Students' cognitive development is needed before the teacher starts to expect the students to use mind mapping. According to Piaget theory of cognitive development, junior high school students attain the formal-operational stage; this

is a stage where they can think about abstract ideas. They can also reason about hypothetical possibilities and deduce new concepts. So, it is an appropriate moment to introduce the use of mind mapping to the students.

In this study, the researcher is interested in conducting experimental research entitled: **"The Effectiveness of Mind Mapping to Teach Writing Skills Viewed from Students' IQ** (An Experimental Study on the Seventh Grade Students of SMPN 1 Prambon in the Academic Year 2009/2010)".

B. Identification of the Problems

Based on the background of the study the researcher can identify many problems why the students' writing skill of the seventh grade of SMPN 1 Prambon is still low. They are as follows:

1. Is the students' mastery on language components such as grammar, vocabulary, and spelling still low?
2. Do they understand how to make a good sentence?
3. Are the students able to create a good paragraph?
4. Do the students understand how to make a coherence paragraph?
5. Do the students have enough exposure with the language?
6. Do they have enough writing practice?
7. Does the teacher give clear and specific instructions to the students?
8. Does the teacher control and monitor the process of writing activities?
9. Do the students use suitable technique in organizing their ideas?
10. Is the use of mind mapping able to improve students' writing skill?

C. Limitation of the Problem

In this quantitative experimental research, the researcher focuses on the effectiveness of mind mapping to improve the students' writing skills due to the fact that the organization of the students' written work is unsatisfactory. In addition, the researcher uses mind mapping to increase the students' ability in organizing their ideas since mind mapping is interconnected with the way how the brain organizes information. The use of mind mapping is also intended to accelerate the fluency of the writing ability of students with low IQ because mind mapping not only demands students to rely on their IQ but also to dig up and use optimally what they already have in their mind.

Descriptive type of text is the only monologue text type which is taught to the seventh grade students in the first semester. Since the population of the research is the seventh grade students, then the researcher only focuses his research on the improvement of students' writing skill of descriptive texts.

D. Problem Statement

Based on the identification of the problems and problem limitation mentioned above, the researcher stated the problems to be researched as follows:

1. Is mindmapping technique more effective than modeling technique in teaching writing?
2. Do students with high IQ have better writing achievement than students having low IQ?
3. Is there any interaction between teaching techniques and students' IQ?

E. Purpose of the Study

In accordance with the problems above, this research is aimed at:

1. finding out whether mindmapping technique is more effective than modeling technique in teaching writing.
2. finding out whether students with high IQ have better writing achievement than students having low IQ.
3. finding out whether there is an interaction between teaching techniques and students' IQ.

F. Research Benefits

The results of this research are expected to give significant contribution to the following people:

1. The students

   Mindmapping is likely to draw students' attention because they can utilize their creative nature in their learning process. Mindmapping give them chance to use not only words but also images, charts, diagrams etc to help them in the stages of the process of making a written product. It is simple, fun, and arousing students' creativity in generating and organizing their ideas, students are getting more active and more encouraged to study writing and improved their writing skills. As a result, the students' writing achievement is improved optimally.

2. The teachers

The research is expected to explore and prove the effectiveness of mindmapping in teaching and learning process so that teachers will be motivated and encouraged to always search for new methods or techniques which fit their teaching. It will also encourage them to always develop their creativity to improve the teaching and learning process. The result of the research will give guidance for teachers to improve their ability to conduct the teaching learning activity more effectively. The result will also provide a clear illustration on how to facilitate, control, and monitor students' writing activity properly.

CHAPTER II

REVIEW OF RELATED LITERATURES, RATIONALE AND HYPOTHESIS

This chapter discusses the review of related theories underlying this research. The discussion covers the basic concept of writing, writing skills and the teaching of writing. The next part of the chapter includes a brief description of mindmapping and intelligence. This chapter is ended with hypotheses.

Review of Related Literature

Writing

a. Definition

Raimes (1983: 3) indicates that writing is an integral part of communication when the other person is not right there in front of us, listening to our words and looking at our gestures and facial expressions.

Cambridge Advance Learners' Dictionary (2008) provides another definition. It is stated that writing is an activity of creating piece of written work, such as stories, poems, or articles. So, it can be said writing is a way of sharing observation, information, thoughts, or ideas with ourselves or other due to the facts that stories, poems, and articles are developed on the basis of ideas, thoughts, information, and observations.

There are other definitions proposed. Byrne (1997: 1) states that writing is the use of graphic symbols which are arranged according a certain conventions to form words and sentences. In addition to the definitions above, he states that

writing is not merely the act of arranging graphic symbols; he states that in writing people produce a sequence of sentences arranged in a particular order and linked together in a certain ways. From the statement, it can be said that writing work follows a gradual stages from a simple use of graphic symbols to a complex arrangement of sentences based on certain rules and conventions. This is supported by Scrivener (1994: 157) who states that writing work in the classroom falls on a continuum from copying which focuses on accuracy to free writing which concentrates on fluency.

From previous elaboration it can be concluded that writing is the act of expressing ideas or thoughts in communication using graphic symbols which are arranged based on certain rules and conventions.

b. Writing Skills

Heaton (1975: 135) states a view that the writing skills are complex and sometimes difficult to teach, requiring mastery not only of grammatical and rhetorical devices but also of conceptual and judgmental elements. The varied skills are grouped into five general components or main areas. They are:

1) language use: the ability to write correct and appropriate sentences;
2) mechanical skills: the ability to use correctly those conventions peculiar to the written language - e.g. punctuation, spelling;
3) treatment of content: the ability to think creatively and develop thoughts, excluding all irrelevant information;

4) stylistic skills: the ability to manipulate sentences and paragraphs, and use language effectively;

5) judgment skills: the ability to write in an appropriate manner for a particular purpose with a particular audience in mind, together with an ability to select, organize and order relevant information.

Matthews, et al. (1985: 71) states that writing skills have several specific skills which are grouped under five headings; they are graphical or visual skills, grammatical skills, expressive or stylistic skills, rhetoric skills, and organisational skills. Details of each heading are as follows:

1) Graphical or Visual Skills. Under this first heading, graphical or visual skills, there are sub headings, i.e. writing graphemes, spelling, punctuation and capitalization, and format.

    a) Writing graphemes is the use of letters of the alphabet, in upper or lower case as appropriate, joined in the standard way. This skill is especially difficult for students whose first language is written in a different alphabet.

    b) Spelling. As a result of the first language interferes, students may apply the phonetic conventions of their native language to spelling English words.

    c) Punctuation and capitalization. Here students' attention needs to be drawn to the fact that conventions differ from language to language, i.e. in English in a numeral with at least four digits, a comma is

inserted after every three digits, counting from the right, but in Indonesia a period is used instead.

d) Format, such as the layout of a letter, or memo. Again these differ from one language to another.

2) Grammatical skills refer to the students' ability to use a variety of sentence patterns and constructions.

3) Expressive or stylistic skills refer to the students' ability to express precise meanings in a variety of styles or registers. In order to do this, they will not only have to be able to select appropriate vocabulary, but also appropriate sentence patterns and structures for the written medium.

4) Rhetorical skills is the students' ability to use linguistic cohesion devices such as connectives, reference words, ellipsis, and so on, in order to link parts of a text into logically related sequences.

5) Organisational skills are similar to those involved in rhetorical skills above, but here they concern with the organisation of a piece of information into paragraphs and texts. This involves the sequencing of ideas as well as the students' ability to reject irrelevant information and summarize relevant points.

Another classification is suggested by Brown (2001: 343) which identifies and enumerates micro skills of writing as follows: (1) producing graphemes and orthographic patterns of English; (2) producing writing at an efficient rate of speed to suit the purpose; (3) producing an acceptable core of words and using appropriate word order patterns; (4) using acceptable grammatical systems (e.g.,

tense, agreement, pluralisation), patterns, and rules; (5) expressing a particular meaning in different grammatical forms; (6) using cohesive devices in written discourse; (7) using the rhetorical forms and conventions of written discourse; (8) appropriately accomplishing the communicative functions of written texts according to form and purpose; (9) conveying links and connections between events and communicate such relations as main idea, supporting idea, new information, given information, generalization, and exemplification; distinguish between literal and implied meaning when writing; (10) correctly conveying culturally specific references in the context of the written text; develop and use a battery of writing strategies, such as accurately assessing the audience's interpretation, using prewriting devices, writing with fluency in the first drafts, using paraphrases and synonyms, soliciting peer and instructor feedback, and using feedback for revising and editing.

So, it can be concluded that writing is the act of expressing ideas or thoughts in communication using graphic symbols which are arranged based on certain rules and conventions. The rules and conventions are concerning with the aspects of content, organization, word choice, language use, and mechanics. Aspect of **content** is talking about the ability to think creatively and develop thoughts, excluding all irrelevant information. **Organization** is the logical order of sentences presented so that the arrangement of the sentences makes sense; it involves unity and coherence. **Vocabulary** is the ability to choose and use wide range of proper words, and idioms. **Language use** is the ability to apply sentence structure and other grammatical features. **Mechanical** aspect is related with the

ability to use correctly those conventions peculiar to the written language, counting punctuation, capitalization, and spelling.

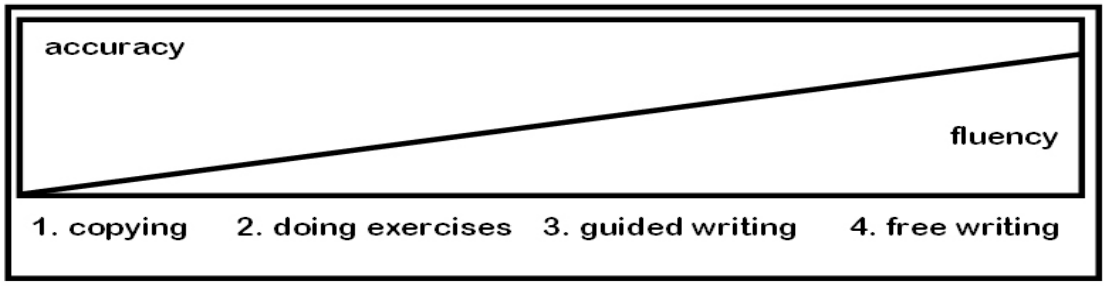
c. Teaching Writing

Integrating the four language skills in the teaching of English is strongly demanded. Byrne (1997: 6) proposes an example that it is impossible to learn to speak a foreign language without learning how to write in it. It is also stated that in the early stages of a course oriented towards oral proficiency, writing serves a variety of pedagogical purposes. The consideration strongly suggests that teacher should teach writing skills as part of an integrated skill approach of language learning. Although at early stages writing will be largely a reinforcement of language learned orally, as the learner progress to the next stages of language learning, teacher can provide for written work on a more extensive scale. In the classroom, guided writing is a very important tool for helping students to become better writers. Help can be given in thinking through ideas, ordering the ideas, considering the vocabulary and grammar, co-operatively preparing notes and draft copies, and in other ways of making preparation to write. Students can learn to become a better writer by being actively encouraged to follow through series of preparatory steps before the final text is produced, and becoming aware of that preparation process, so that it can be done more independently and fluently in the future.

In line with the ideas above, Scrivener (1994: 155) states that writing work in the classroom falls on a continuum from copying to free writing. At one end the

students are practicing forming letter shapes in a handwriting book, noting down substitutions tables form the board, copying example from a textbook, etc. At the other end the students choose subject matter and the form of a written work to do. As shown in the figure below, accuracy is more of concern towards the beginning level; the learning focus shifts slowly towards fluency as the level increases.

Figure 1: Writing Continuum

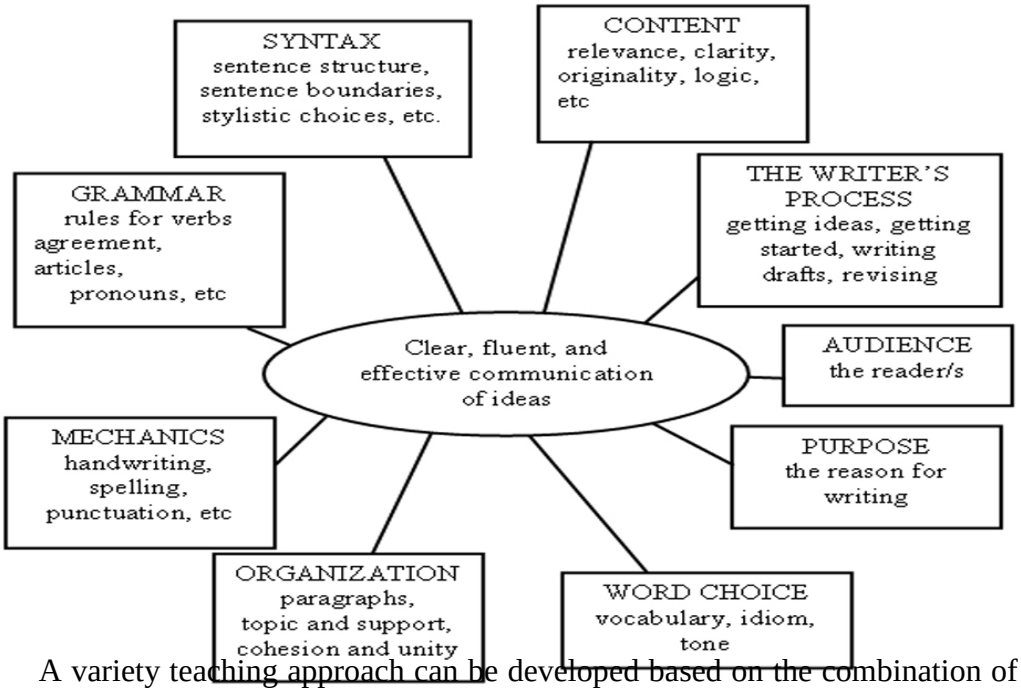


In addition, Brown (2001: 343-346) states that there are at least five types of classroom writing performance. The first is imitative or writing down. At the beginning level of learning to write, students will simply write down English letters, words, and possibly sentences in order to learn the conventions of orthographic code. The second is intensive or controlled. A common form of controlled writing is to present a paragraph to students in which they have to alter a given structure throughout. For example, the students may be asked to change all present tense verbs to past tense; in such a case, students may need to alter other time references in the paragraph. The next type is self-writing. The most salient instance of this category in classrooms is note-taking, where students take notes during a lecture for the purpose of later recall. Diary or journal writing also falls into this category. Display writing is considered as the fourth type of

classroom writing performance. For all language students, short answer exercises, essay examinations, and even research reports will involve an element of display. For academically bound ESL students, one of the academic skills that they need to master is a whole array of display writing techniques. The last type is real writing. The two categories of real and display writing are actually two ends of a continuum, and in between the two extremes lay some combination of display and real writing. Three subcategories illustrate how reality can be injected: academic, vocational/technical or personal.

Writing skills are very complex and delicate to master. Raimes (1983: 6) states there are several things that the writer has to deal with as they produce a piece of writing. They are shown in the diagram below.

Figure 2: Producing a Piece of Writing



A variety teaching approach can be developed based on the combination of different features in the diagram. Teachers may stresses different features of the

diagram, combining those different features with how teachers think writing is learned would create numerous teaching approach that can be used in the writing classes. Something that should keep in mind is that writing means writing a connected text and not just single sentence, that we write for a purpose as well as for a reader and that the process of writing is a valuable learning tool for all of students.

Brown (2001: 335) states the complexity of writing that writing is not simply the graphic representation of spoken language but it is a process which requires an entirely different set of competencies. Written products are often the result of thinking, drafting, and revising procedures that require specialization skills, skills that not every speaker develops naturally. The upshot of the compositional nature of writing has produced writing pedagogy that focuses students on how to generate ideas, how to organize them coherently, how to use discourse markers and rhetorical conventions, to put them cohesively into a written text, how to revise text for clearer meaning, how to edit the text for appropriate grammar and how to produce a final product.

d. Writing Tasks

Writing tasks must be constructed in such a way that tasks start from a simple/discrete ones gradually shift to free direct writing tasks. Heaton (1975: 139) suggests the following stages of gradation in constructing writing tasks.

1) Fill in schedule of daily activities;

2) Write a simple short message;

3) Write a simple letter to a pen pal;

4) Filling out a dialogue;

5) Write down a simple article based on a table containing information;

6) Write down a simple story based on a series of pictures

7) Write down a story based on single but more complex picture;

8) Write a text based on verbal stimuli.

In line with Heaton, Brown (2001: 343) classifies writing performances into five major categories; they are: 1) imitative, or writing down; 2) intensive, or controlled; 3) self-writing; 4) display writing; and 5) real writing.

Mindmapping

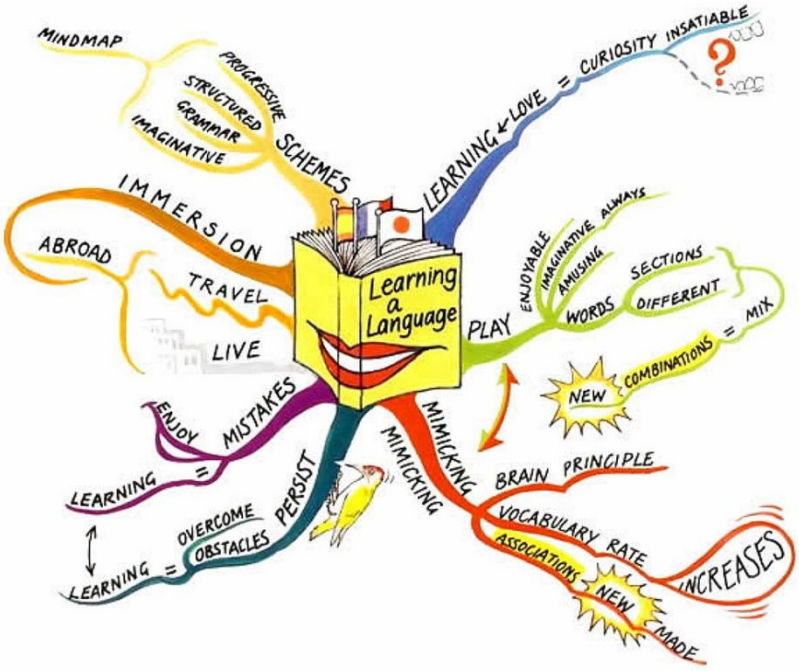
a. Definition

Hedge (1998: 30) states making a mind map is a strategy for note-making before writing; in other words, scribbling down ideas about a topic and developing those ideas as the mind makes associations. So, it can be said that mind mapping can give students a way to begin writing assignments. Hayes (1992: 203) states that through mind mapping students turns random thoughts into patterns that can be written down and developed. Students become increasingly motivated to complete a writing task as their ideas emerge in organized forms.

It can be seen from the next figure that in mind mapping ideas presented in a radial, graphical, non-linear manner, so mind maps encourage a brainstorming approach to planning and organizational tasks freely. Though the branches of a mindmap represent hierarchical tree structures, their radial arrangement disrupts

the prioritizing of concepts typically associated with hierarchies presented with more linear visual cues. This orientation towards brainstorming encourages users to enumerate and connect concepts without a tendency to begin within a particular conceptual framework.

Figure 3: An example of mind mapping taken from http://en.wikipedia.org/wiki



From above elaboration it can be concluded that A mind map is a diagram used to represent words, ideas, tasks, or other items linked to and arranged radially around a central key word or idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing.

b. The Use of Mindmapping

It has been stated before that mind map can give assistance for students to start writing assignments. In fact many students find writing difficult, and most of them find getting started the most difficult part of writing. Hayes (1992: 203) states that mind mapping can reduce difficulty in starting writing assignments by giving students an organizing strategy to get them started. He explains that ideas are freely associated and written out without pressure, thereby reducing tension and resistance often associated with writing. The product of the prewriting activity is an organized cluster of thoughts, which helps students stay on task when they write.

Sufficient preparation must be made before teacher asks the students to apply the mindmapping. Buzan *(http://en.wikipedia.org/wiki/Mind_Mapping)* states that teacher must do specific preparation including try to map the material. This step is used to uncover any potential problems. The teacher's diagram can also serve as a model against which to assess group work. Complete procedure of the employment of mindmapping in the classroom by Buzan is as follow: 1) Describe or demonstrate the process to the students; 2) Divide the students into groups which consist of four students; 3) Present the central concept/material that the students must graph; 4) Ask the groups to brainstorm, writing a list of terms and phrases that express core concepts and supporting details; 5) Ask the students to start sketching out the diagram; 6) Deliver any necessary suggestions to the groups while they are working; 7) Ask them to developed the main concept by adding some new ideas and relationships as they construct the map.

The following is procedure of employing mind mapping in the classroom as described by Hedge (1998: 30).

Students are given a main topic at the centre of the board.

Students jot down all the things associated with the main topic that come into their minds.

Students share with each other about what they have jotted down – teacher gives any necessary explanations and suggestions.

Ideas are elicited from the students as they suggest things, and a mind map is made collectively on the board as the ideas suggested so that students can see how to draw out aspects of the topic and subgroup items. This step based on the reasoning behind mind map that is not to think in an ordered or linear way, but explore a topic by moving between its various aspects.

Branches are then drawn and added as the students suggest new ideas or add ideas to already established aspects. The end result is a map with a number of subtopics or aspects radiating from the central topic (main topic) and with further points added to these.

When the map is reasonably full, teacher leads a class discussion on the best order in which points could be presented in a composition.

Alternative writing tasks are then can be proposed: ask students to prepare a piece of writing using the mind map on the board, elaborate it in their own ways or ask students to choose other topics and draw up their personal mind maps for their own topics.

c. The Effectiveness of Mindmapping

Buzan *(http://en.wikipedia.org/wiki/Mind_Mapping)* claims that the mind map is a vastly superior note taking method because it does not lead to a "semi-hypnotic trance" state induced by other note forms. Buzan also argues that the mind map utilizes the full range of left and right human cortical skills, balances the brain, taps into the alleged 99% of your unused mental potential, as well as intuition (which he calls "super logic"). However, scholarly research suggests that such claims may actually be marketing hype based on misconceptions about the brain and the cerebral hemispheres. Critics argue that hemispheric specialization theory has been identified as pseudoscientific when applied to mindmapping.

Scholarly research found that the mind map technique had a limited but significant impact on memory recall in undergraduate students (a 10% increase over baseline for a 600-word text only) as compared to preferred study methods (a −6% increase over baseline). This improvement was only robust after a week for those in the mind map group, and there was a significant decrease in motivation compared to the subjects' preferred methods of note taking. It is suggested that learners preferred to use other methods because using a mind map was an unfamiliar technique, and its status as a "memory enhancing" technique engendered reluctance to apply it (in www.interscience.wiley.com/journal/118952400/abstract?CRETRY=1&SRETRY=0). Other research found that learners tended to learn far better by focusing on the content of learning material rather

than worrying over any one particular form of note taking (in www.questia.com/PM.qst?a=o&d=16186492).

Conventional Outlining

Outline which usually takes the form of note taking and note making is an important stage in the preparatory stages of a written work and also in stages of reading comprehension.

Cranmer (1985: 75) states composition as well as summary should have a preparatory note stage; therefore, teachers are recommended to tell their students to prepare their composition in a note form before writing the composition itself. The statement implies that outline is an important part to set before students produce a written work or after they read a written work. The only difference, maybe, is that whereas the notes for a summary are derived from a pre-existing text, those for composition are normally derived from thoughts or ideas. Each of the process of above may be considered as the same but with different mode of input and output.

The suggestion as a matter of fact is something which should be given a great deal of attention and consideration since there are many insufficient instructions given by teachers in the process of producing written text. Many teachers simply said: “Don’t forget to make a plant first,” or when in summary writing activities: “Remember to leave out the unimportant elements, OK!” But

then, the students are given little or even no guidance as to how to take notes, how to plan or how to identify the unimportant elements. It doesn't mean that these are unrecognized ways of teaching such things, but these are rarely taught and in some cases it brings serious problems.

As an eminent technique, at some points the approach of outlining mentioned above has considerable weakness. Cranmer (1985: 76) states the weaknesses of conventional outlining are as follows: Précis, one well known type of summary, is useless since the result of the summary is usually still too long. The summary will be much more useful if students could reduce a 10-page article to 200 words or a 200 pages book to 10 pages.

A similar weakness also exists in the usual type of composition. It usually includes too many details and consists of strings of single words and phrases, all of which will appear in the final version. This kind of matter usually results in lack of coherence from sentence to sentence because teachers concern too much on students' vocabulary and grammatical matter. As a matter of fact, organization of a written work is a difficult matter for students, even when they write in their native language.

Other greater problem is that note should follow a rigid fixed form that is in linear form. In outlining, ideas must be arranged sequentially; second main idea must be written after the first one and so on. This concept is contradictory with the natural way of how our brain work, because our brain in a non linear way.

Intelligence

a. Definition

Microsoft® Encarta® 2008 states the core meaning of intelligence as having the ability to learn and understand easily. Wechsler and Binet, the founders of two well acknowledged intelligence tests, have other definitions of intelligence. Binet in Whittaker (1970: 438) states that intelligence is an overall ability of human being; it is a general mental ability verbal and non verbal that is complex in character and that intelligence does not qualitatively differ among individuals but it reflects quantitative differences. Wechsler in Whittaker (1970: 443) defines intelligence as the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment.

Dalyono (2001: 124) defines intelligence as follow.

> *Inteligensi adalah kemampuan yang bersifat umum untuk mengadakan penyesuaian terhadap situasi atau masalah. Kemampuan yang bersifat umum tersebut meliputi berbagai jenis kemampuan psikis, seperti: abstrak, berfikir, mekanis, matematis, memahami, mengingat, berbahasa dan sebagainya.*

Whittaker (1970: 444) illustrates two different definitions of intelligence. He states that layman usually thinks of intelligence as the innate, biological, God-given ability to think or to solve problems, while psychologist, on the other hand, recognizes that the most useful conception of intelligence reflects the individual's intellectual capabilities at any given time where the capabilities reflect both the individual's biological potential and his experiences of training since birth.

Jordan (2006: 215) states an identical idea that there are scientists who favor unitary models of intelligence. Those scientists argue that, although there

are numerous specific abilities (like language and mathematics), these specific abilities are all related to a general, overarching intelligence. Other scientists favor the existence of more than one intelligence note that different “intelligences” are valued by different cultures. For example, in Western cultures verbal and logical abilities are valued, whereas tribal cultures in Indonesia, for example, may value the exceptional spatial ability needed for navigation, for identifying one’s cattle, or for identifying certain plants needed for medication.

From some definitions above, it can be concluded that intelligence is the general mental ability of individual to think rationally and to adapt himself to new circumstances in the environment. It describes the aspects of verbal intelligence, performance (abstract-visual) intelligence, quantitative ability, and short-term memory. Verbal intelligence is the capacity to understand and reason with language. Performance intelligence is the capacity to understand and apply visual-spatial relationships. Quantitative ability is competence to in understanding and using numerical concepts. Short-term memory is the ability to retain in memory verbal and visual-spatial information presented just before recall is attempted.

b. Theories of intelligence

The most widely accepted theory of intelligence is based on psychometrics testing or intelligence quotient (IQ) tests. Two of the most recognize psychometrics tests are Stanford Binet and Wechsler Scale.

Stanford-Binet Scale is an IQ test founded by two French scientists, Simon and Binet. It provides a single quantitative index of mental development

(Whittaker, 1970: 439). Intelligence is represented as a ratio of mental age to chronological age as shown in the formula below:

$$I.Q. = \frac{Mental\_Age\_(M.A.)}{Chronological\_Age\_(C.A.)} x100$$

Therefore, if an individual is 15 years of age and has a mental age of 15 years, his IQ is 100. If the mental age is greater than chronological age, the IQ is more than 100. If the chronological age is greater than mental age, the IQ is lower than 100. A 15 years-old child belongs to very superior group when he has a mental age of 21 years; conversely he will belong to mentally defective if he has a mental age of 10 years.

The IQ, then, is actually a type of standard score that tells us how far below or how far above his own group a given individual stands in mental ability. Verbal descriptions commonly used in the interpretation of IQs are shown in the table 1.

Table 1

Verbal descriptions assigned to various ranges of intelligence quotients.

I.Q.	Verbal Description
140 and above	Very Superior
120 – 139	Superior
110 – 119	High Average
90 – 109	Average
80 – 89	Low Average
70 – 79	Borderline
Below 70	Mentally Defective

The significance of IQs on the revised Stanford-Binet Scales (Whittaker, 1970: 440)

Wechsler in Whittaker (1970: 446), a psychologist associated with Bellevue Hospital in New York city, devises another intelligence scales for adults and

adolescents in 1939. The revision of the test, published in 1955, is called WAIS. The scale is organized into a series of 10 subtests, each containing items arranged in order of difficulty. The subtests consist of: (1) information; (2) general comprehension; (3) arithmetical reasoning; (4) memory span for digits; forward and backward; (5) similarities; (6) picture arrangement; (7) picture completion; (8) block assembly; and (10) a digit symbol test.

Whittaker (1970: 447) implies that the IQ on this test is determined on the basis of norms derived from the standardization group. The mean score for each age group on the total test is assigned an IQ value of 100, and a standard deviation is 15. Thus, a person whose total weighed score on the test falls one standard deviation below the mean of the standardization age group is assigned an IQ of 85. As another example, if the total weighed score falls one standard deviation above the standardization group for the individual's age, his IQ is 115.

Other examples of IQ tests are Thurstone's Primary Mental Abilities, Kaufman Assessment Battery for Children, and Raven's Progressive Matrices (Dalyono, 2001).

All forms of IQ tests correlate highly with one another. The traditional view is that these tests measure general intelligence factor. Psychological Consultant Bureau which administered IQ test in SMP 1 Prambon indicates that they administered the test to find out the general intelligence of the students. It is stated in the form of the test result as follows:

> *Kecerdasan Umum adalah suatu kecerdasan untuk berfikir secara global rasional dan menyesuaikan diri dengan lingkungannya secara efektif. Juga termasuk kemampuan untuk memusatkan perhatian pada satu masalah dan*

menyelesaikannya secara cepat, tepat tanpa menimbulkan dampak emosional negatif.

IQ tests were originally devised specifically to predict educational achievement, although the inventors of the IQ did not believe they were measuring fixed intelligence. From his research, Binet found out that intelligence increases until about the age of 13. It increases with age up to a certain point, levels up, and eventually declines. The facts suggest that the earlier the test is given, the less stable is the measurement in ability. The test results in a more stable measurement of ability when it is given to 11-year-old to 17 years of age (Whittaker, 1970: 440). Therefore, IQ test is usually administered towards junior high school students.

However, dissatisfaction with those traditional IQ tests has led to the development of a number of alternative theories, all of which suggest that intelligence is the result of a number of independent abilities, rather than general one, and uniquely contribute to human performance. Among others are Multiple Intelligences Theory, Triarchic Theory of Intelligence and Emotional Intelligence Theory.

Multiple Intelligences. In 1983, Howard Gardner of Harvard University proposed the theory of multiple intelligences. Originally there were seven multiple intelligences; they are: linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial, interpersonal, and intrapersonal. Gardner (1999: 48-60) introduces three others; those three are: naturalist, spiritual, and

existential intelligence. So there are ten multiple intelligences; the indicators of ability in those multiple intelligences are as follows:

Linguistic intelligence: Sensitivity to language, both spoken and written; ability to learn languages; and the ability to use language to meet objectives.

Logical-mathematical intelligence: The abilities to analyze problems in a logical way, execute mathematical operations, and use a scientific approach to investigate problems.

Musical intelligence: Sensitivity to and appreciation of musical patterns; ability to perform and compose music.

Bodily-kinesthetic intelligence: The use of the body to solve problems or create products or performances.

Spatial intelligence: Recognition and manipulation of spatial patterns in wide space and confined space.

Interpersonal intelligence: The ability to understand the intentions, desires, and feelings of others and to work effectively with others.

Intrapersonal intelligence: Understanding of oneself (abilities, feelings, desires) and the ability to act effectively on this understanding.

Naturalist intelligence: The ability to recognize and distinguish among species; the capacity to articulate relations among species.

Spiritual intelligence: Interest and concern with deep questions of existence (e.g. who are we? why do we exist?).

Existential intelligence: The capacity to locate oneself with respect to the furthest reaches of the cosmos and the related capacity to locate oneself with respect to such existential features of human condition as the significance of life, the meaning of death, the ultimate fate of the physical and psychological worlds, and such profound experiences as love of another person or total immersion in a work of art.

Although those intelligences are viewed as independent which means students are likely to be stronger in certain sub-intelligence than others, there are still some possibilities that a student is strong in a group of sub-intelligences. Gardner (1999: 37) states as follows:

> "I believe that, even if the cores or sub-intelligences are actually separate from one another, they tend to be used in conjunction with one another and so merit being grouped together. In other words, even if there were some scientific justification for disaggregating the cores, there is much to be said for positing a small number of intelligences."

Triarchic Theory of Intelligence. Robert Sternberg's triarchic theory of intelligence proposes three fundamental aspects of intelligence — analytic, creative, and practical — of which only the first is measured to any significant extent by mainstream tests. His investigations suggest the need for a balance between analytic intelligence, on the one hand, and creative and especially practical intelligence on the other. Sternberg and Grigorenko in Jordan and Porath (2006: 225) state three abilities make up their concept of successful intelligence or triarchic intelligence; they are:

Analytical ability: Analysis, evaluation, comparison, and contrast.

Creative ability: Creation, intention, or discovery.

Practical ability: Put into practice, apply, or use what has been learned.

The ability to analyze is stressed in school, while creative and practical ability may be more important in the real world.

Emotional Intelligence. Goleman in Pasiak (2002: 15) has developed the concept of emotional intelligence and claims it has more contribution to people's success than more traditional sorts of intelligence. The theories of emotional intelligence grew from observations of human development and of brain injury victims who demonstrate an acute loss of a particular cognitive function — e.g. the ability to think numerically, or the ability to understand written language — without showing any loss in other cognitive areas. Pasiak (2002: 19) states that parts in human brain responsible for many different functions. Emotional quotient leans on emotion path in human brain which is associated with the limbic system of human.

Review on Related Research

There are some researchers giving evidences of the implementation of mind mapping to teach writing. First, Sugiharto (2009: 96) concludes that mind mapping can help students improve their writing. They understood the generic structure, the language features, and the text organizer of a procedure text well. It also created a favorable classroom's atmosphere. The class' atmosphere became very alive because students interacted with their

friends freely. Students enjoyed the learning since the teacher did not dominate the classroom activities during the teaching learning process.

Another research on mind mapping is done by Farrand, Hussain, and Hennessy in 2002. They found that the mind map technique had a limited but significant impact on memory recall in undergraduate students as compared to preferred study methods. This improvement was only robust after a week for those in the mind map group and there was a significant decrease in motivation compared to the subjects' preferred methods of note taking. Nevertheless the conclusion of the study was mind map provides an effective study technique when applied to written material. However before mind map is generally adopted as a study technique, consideration has to be given towards ways of improving motivation amongst users (in *http://en.wikipedia.org/wiki/Mind_Mapping*).

Considering the concept of writing, mind mapping and review on related researches conducted on the implementation of mind mapping in the teaching writing, it can be assumed that by implementing mind mapping in this study, the students can improve their writing.

Rationale

The difference between mindmapping and modeling for teaching writing.

Writing is a complex work of language. It involves some aspects like grammar, spelling, punctuation, and organization. To be able to produces a good work of writing, students need to be given chance to learn how to

write well. They also have to be given more opportunity to explore their creativity in arranging their ideas, the organization of their writing works. In mindmapping, ideas are presented in a radial, graphical, non-linear manner; mind maps encourage a brainstorming approach to planning and organizational tasks. Though the branches of a mind map represent hierarchical tree structures, their radial arrangement disrupts the prioritizing of concepts typically associated with hierarchies presented with more linear visual cues. This orientation towards brainstorming encourages users to enumerate and connect concepts without a tendency to begin within a particular conceptual framework. Therefore, it gives students broad chance to dig and developed their ideas. Furthermore mindmapping uses not only verbal feature but also pictures and symbols, which is inline with human brain's attitude in perceiving and retrieving information. Human brain perceives and retrieves information nonlinearly and it also processes information not only in the form of verbal but also in the form pictures and symbols. Therefore, it can be assumed that mindmapping is very effective to increase students' writing achievement.

The difference achievement between students having high IQ and students having low IQ.

Writing has several skills and some of them are hierarchical which means some skills must be mastered first before a student masters the other ones. Students with high IQ do not face any problems dealing with the

structure of the writing material. Most of them are surely able to cope with the material in line with the schedule of the appearance.

The problems usually seize the students with low IQ. The problems arise and become not only greater but also more complex at later time since before they can fully master the previous materials, they have to deal with the new one. Unfortunately, the previous materials are needed if they want to cope with the new ones. Without mastering the old one it is almost not possible to deal with the next materials. From other point of view, students with high IQ usually have certain learning strategy; therefore, they have prepared the stages to deal with the materials. Therefore, it can be assumed that students having high IQ will have a better achievement in writing.

The interaction between teaching techniques and students' IQ in teaching writing.

Some techniques are better for students with high IQ. Mindmapping is one of the techniques which are appropriate for students having high IQ. Mindmapping is focused on the organizing of the ideas of the writer. It is hard for students with low IQ to use it since they tend to have problem with the vocabulary matter and have to deal firstly with other features of writing before they come to the organization of the ideas. Modeling technique, on the other hand, is appropriate for the students with low IQ. This is due to the fact that modeling gives direct example on how to arrange the organization of ideas by giving an exact design of generic structure of the text aimed. It gives chance to the low IQ students to be focal on more mechanical aspects of language.

Therefore, it can be assumed that there is an interaction between techniques employed by teachers and students' IQ; in other words, students with higher IQ will have a better suitability to be taught using mindmapping technique.

Hypothesis

Based on the above review of related literatures and rationale, the hypotheses can be formulated as follows:

Mindmapping technique is more effective than modeling technique in teaching writing.

Students with high IQ have better writing achievement than students having low IQ.

There is an interaction between teaching techniques and students' IQ in teaching writing. Mindmapping technique is more suitable for students with high IQ while modeling is more appropriate for low IQ students.

CHAPTER III

RESEARCH METHODOLOGY

This chapter is devoted to discuss (1) Research Setting; (2) Research Design; (3) Population, Sample and Sampling; (4) Techniques of Collecting the Data; and (5) Techniques of Analyzing the Data.

A. Research Setting

The research was conducted in SMPN 1 Prambon Nganjuk which is located on Watudandang Village, Prambon, Nganjuk. This school was chosen because it is the school where the researcher has been teaching English since 2007, so there was a bigger chance for the researcher to be permitted to conduct research at the school. Another reason was that mindmapping technique has never been applied in this school. That was known by the researcher after he conducted the preliminary observation and interviewed some of the teachers in SMP 1 Prambon.

This experiment was conducted from January 2009 to December 2009, beginning from observation, writing the research proposal, up to the last activity that is writing the research report. The time schedule was as follows:

1. Preliminary observation : January 2009
2. Designing research proposal : February 2009
3. Developing research instrument : March-April 2009
4. Conducting proposal seminar : April 2009
5. Revising the research instrument : May – June 2009

6. Giving treatment and collecting data : July-August 2009
7. Discussing the data analysis : September-November 2009
8. Writing research report was accomplished in December 2009
9. Thesis examination : February 2010

B. Research Design

The design of this research is Simple Factorial Design (Sugiyono, 2008: 77-79). It aims to study the independent variable, Mindmapping and observe the effect on the dependent variable, Writing Skill. In this research, there were two groups – experimental group and control group. Based on the result of IQ test that had been conducted at school by a professional IQ test institution, every group was classified into two categories – the students with high IQ and the ones with low IQ. In the teaching learning process, the materials for both groups are the same. In the experimental group, the students were taught by using mindmapping technique, while in the control group, the students were taught using modeling technique. After the treatment, both groups were given a posttest to measure the improvement of the students' writing skill. The test item was tried out before it was used to test the subject of the research. The tried out was given to a group of students who do not belong to the experimental and control class. The writing post test was conducted on 25th of August 2009. The result was scored using a writing scoring rubric. Based on the scoring rubric, the lowest possible score is 34 while the highest possible score is 100. The researcher used an inter rater to reduce the level of subjectivity of the scoring.

C. Population, Sample, and Sampling

1. Population

The population of this research is taken from the students of the seventh grade of SMPN 1 Prambon Kabupaten Nganjuk in the academic year 2009/2010.

2. Sample

The sample of this research was the students of class VII 8 and VII 9 of SMPN 1 Prambon Nganjuk. The researcher intentionally took classes which the researcher teaches. Practicality is the main consideration when the researcher chose the classes. The total number of the sample is 72 students. They were grouped into two classes. One was the experimental class and the other was the control class. The experimental group was class VII 9 which consists of 36 students while the control group was class VII 8 which also consists of 36 students. Every group was classified by the result of IQ test into students with high IQ and students with low IQ.

3. Sampling

This research uses a cluster random sampling to choose the sample of the research. This technique of sampling was chosen under the following considerations:

a. It is very difficult to list all the students of a class of the school. However, it would be likely to randomly select a subset of classes.

b. The population is concentrated in “natural” cluster (classes).

c. Most of the variation in the population is within groups, not between them.

So, from the total population 322 students which are divided into 9 classes, the researcher randomly took 2 classes, one for the experimental class and the other one for the control class. The experimental class consists of 36 students and so does the control class.

D. Data Collecting Techniques

The data needed in this research are the scores of students' IQ and the scores of the students writing. Since the scores of the students' IQ were taken from the result of the IQ test conducted by an independent institution in the researcher's school, so the researcher only has to prepare a set of writing test. Based on the result of the IQ test, the students from both experimental and control group were classified into students with high IQ and the ones with low IQ.

The set of writing test only consisted of one test item. It is used to collect data related to the students' improvements after the treatment is given to both groups. Before the instrument is used in the real test, there was a try-out on the instrument. The aim of conducting the try-out test is to get information dealing with the characteristics of the test. Best (1981: 197) indicates that a good test must have several features; two of them are validity and reliability. Since the test item is in the form of a single instruction, the try out was done to note the readability. The try out was done by asking a group of students who are not the subjects of the

research; and the test item is readable since most of them state that it can be understood and they can execute the test based on the test item. The test item is as follow: Write down a descriptive text about your own bicycle.

E. Data Analysis Techniques

The data are analyzed using descriptive and inferential statistic because the researcher wants to present the interpretation of the data and takes a conclusion on the effectiveness of the treatment and the correlation between the techniques and the students' IQ. The first procedure to analyze data is arranging the data and then classifying them into some categories. In classifying the data, the data are sorted and then ranked based on the result of the IQ test from the highest IQ to the lowest one. After the researcher gets the ranking, he takes 27% of the highest scores as a group of students with high IQ and 27% f the lowest scores as a group of students with low IQ. (Rasyid, 2007: 247) The next step is checking the normality and homogeneity of the data. Finally, analyzing them using ANOVA or Analysis of Variance and Tukey test.

Below is an example of ANOVA table.

Technique / Students IQ	Mind Mapping (A_1)	Modeling (A_2)	Total
High (B_1)	A_1B_1	A_2B_1	
Low (B_2)	A_1B_2	A_2B_2	
Total			

1. ANOVA Test:

This research uses factorial ANOVA. The type of the factorial ANOVA is the 2x2 design. It contains two independent variables, Mindmapping technique and modeling technique. Each variable has two levels or separate values, high IQ and low IQ. The analyses of multi factors of variance are as follows:

a. The total sum of squares:

$$\sum x_t^{\,2} = \sum X_t^{\,2} - \frac{\left(\sum X_t\right)^2}{N}$$

b. The sum of squares between groups:

$$\sum x_t^{\,2} = \frac{\left(\sum X_1\right)^2}{n_1} - \frac{\left(\sum X_2\right)^2}{n_2} - \frac{\left(\sum X_3\right)^2}{n_3} - \frac{\left(\sum X_4\right)^2}{n_4} - \frac{\left(\sum X_t\right)^2}{N}$$

c. The sum of squares within groups:

$$\sum x_w^{\,2} = \sum x_t^{\,2} - \sum x_b^{\,2}$$

d. The between-columns sum of squares:

$$\sum x_{bc}^{\,2} = \frac{\left(\sum X_{c1}\right)^2}{n_{c1}} - \frac{\left(\sum X_{c2}\right)^2}{n_{c2}} - \frac{\left(\sum X_t\right)^2}{N}$$

e. The between-rows sum of squares:

$$\sum x_{br}^{\,2} = \frac{\left(\sum X_{r1}\right)^2}{n_{r1}} - \frac{\left(\sum X_{r2}\right)^2}{n_{r2}} - \frac{\left(\sum X_t\right)^2}{N}$$

f. The sum-of-squares interaction:

$$\sum x_{\text{int}}^{\,2} = \sum x_b^{\,2} - \left(\sum x_{bc}^{\,2} - \sum x_{br}^{\,2}\right)$$

g. The number of degrees of freedom associated with each source of variation:

df for between-columns sum of squares = C – 1 = 2 – 1 = 1

df for between-rows sum of squares = R – 1 = 2 – 1 = 1

df for interaction = (C – 1)(R – 1) = 1 X 1 = 1

df for between-groups sum of squares = G -1 = 4 – 1 = 3

df for within-groups sum of squares = ∑(n-1) =

df for total sum of squares = N – 1 =

where:

C = the number of the column

R = the number of rows

G = the number of groups

n = the number of subjects in one group

N = the number of subjects in all groups

2. Tukey Test:

The ANOVA test is used to find out if there is a significant different between groups means. However, it analysis only indicates that there is a difference between groups means, but it does not show what means there is a significant difference between. Therefore, a post hoc test needs to be done. Tukey test is a post hoc test designed to perform a pair wise comparison of the means to see where the significant difference is. There is a procedure to follow in conducting the TUKEY test. First, arrange the means in ascending

order in a comparison table and calculate the difference between each pair of means. Second, calculate the minimum pair wise difference needed using the formula below. The final step is comparing the difference between the means in the table constructed to the minimum pair wise difference. The means pair is significantly different when its difference is larger than the minimum pair wise difference.

The formula of the Tukey test is as follows:

a. Mind mapping compared with modeling in teaching writing

$$q = \frac{\overline{X}_{c1} - \overline{X}_{c2}}{\sqrt{ErrorVariance / n}}$$

b. Mind mapping compared with modeling in teaching writing for students having high IQ

$$q = \frac{\overline{X}_{c1r1} - \overline{X}_{c2r1}}{\sqrt{ErrorVariance / n}}$$

c. Mind mapping compared with modeling in teaching writing for students having low IQ

$$q = \frac{\overline{X}_{c1r2} - \overline{X}_{c2r2}}{\sqrt{ErrorVariance / n}}$$

or

$$q = \frac{\overline{X}_{c2r2} - \overline{X}_{c1r2}}{\sqrt{ErrorVariance / n}}$$

CHAPTER IV

RESEARCH FINDING

Research data are taken from the writing post test. The data are analyzed to get the clear conclusion. The steps that are taken can be classified as the following steps: (1) Data description; (2) Data analysis; (3) Hypotheses verification; and (4) Discussion. These four steps can be classified chronologically and explained clearly as follows:

Data Description

The posttest scores are classified into 6 categories: (1) The scores of the students who are taught using Mindmapping technique (A_1); (2) the scores of those who are taught using modeling technique (A_2); (3) the scores of those having high IQ who are taught using Mindmapping (A_1B_1); (4) the scores of those having low IQ who are taught using Mindmapping (A_1B_2); (5) the scores of those having high IQ who are taught using modeling (A_2B_1); (6) the scores of those having low IQ who are taught using modeling (A_2B_2).

The followings are the detail descriptions of students' scores in each category.

1. The scores of the students in the experimental class who are taught using Mindmapping technique (A_1)

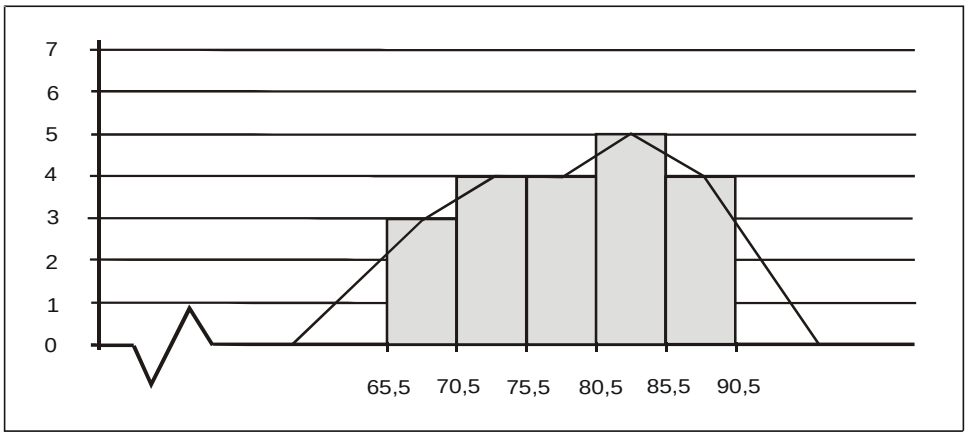
   The scores are 69, 70, 70, 72, 73, 75, 75, 77, 78, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, and 90.

The data description shows that the range of the scores is 21. The mean is 79.15. The mode is 75. The median is 79. And the standard deviation is 6.45. *(see appendix page 118)*

Table 2. Frequency distribution A_1.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
66 - 70	65.5 - 70.5	68		3	15%
71 - 75	70.5 - 75.5	73		4	20%
76 - 80	75.5 - 80.5	78		4	20%
81 - 85	80.5 - 85.5	83		5	25%
86 - 90	85.5 - 90.5	88		4	20%
				20	100%

Figure 3. The histogram and polygon of the students taught using Mindmapping technique.



2. The scores of the students in the control class who are taught using Modeling technique (A_2)

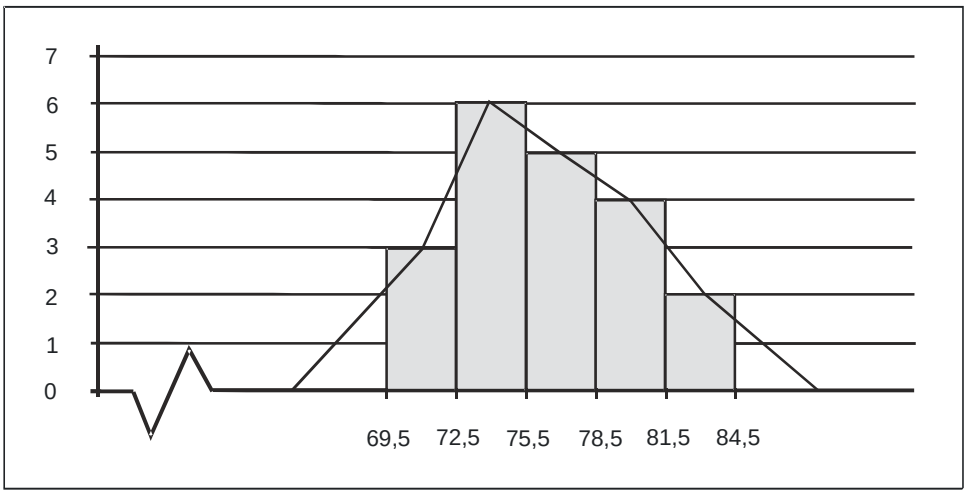
The students' scores are: 70, 72, 72, 73, 73, 74, 74, 75, 75, 76, 76, 77, 77, 78, 79, 79, 80, 80, 82, and 84.

The data description shows that the range of the scores is 14. The mean is 76.3. The mode is 74. The median is 76. And the standard deviation is 3.63. *(see appendix page 119)*

Table 3. Frequency distribution A_2.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
70 - 72	69.5 - 72.5	71		3	15%
73 - 75	72.5 - 75.5	74		6	30%
76 - 78	75.5 - 78.5	77		5	25%
79 - 81	78.5 - 81.5	80		4	20%
82 - 84	81.5 - 84.5	83		2	10%
				20	100%

Figure 4. The histogram and polygon of the students taught using Modeling technique.



3. The scores of the students having high IQ who are taught using Mindmapping technique (A_1B_1)

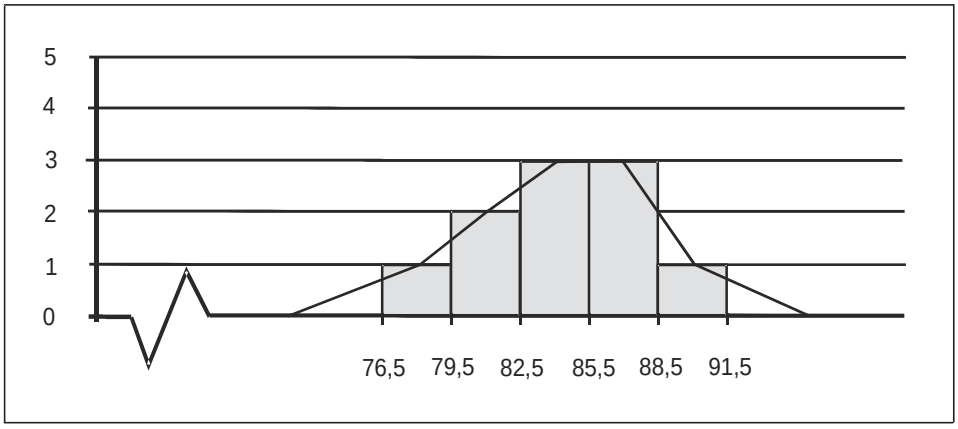
The students' scores are: 78, 80, 82, 83, 84, 85, 86, 87, 88, and 90.

The data description shows that the range of the scores is 12. The mean is 84.3. The mode is 85. The median is 84.5. And the standard deviation is 3.683. *(see appendix 120)*

Table 4. Frequency distribution A_1 B_1.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
77 - 79	76.5 - 79.5	78		1	10%
80 - 82	79.5 - 82.5	81		2	20%
83 - 85	82.5 - 85.5	84		3	30%
86 - 88	85.5 - 88.5	87		3	30%
89 - 91	88.5 - 91.5	90		1	10%
				20	100%

Figure 5. The histogram and polygon of the students having high IQ taught using Mindmapping technique.



4. The scores of the students having low IQ who are taught using Mindmapping technique (A_1B_2)

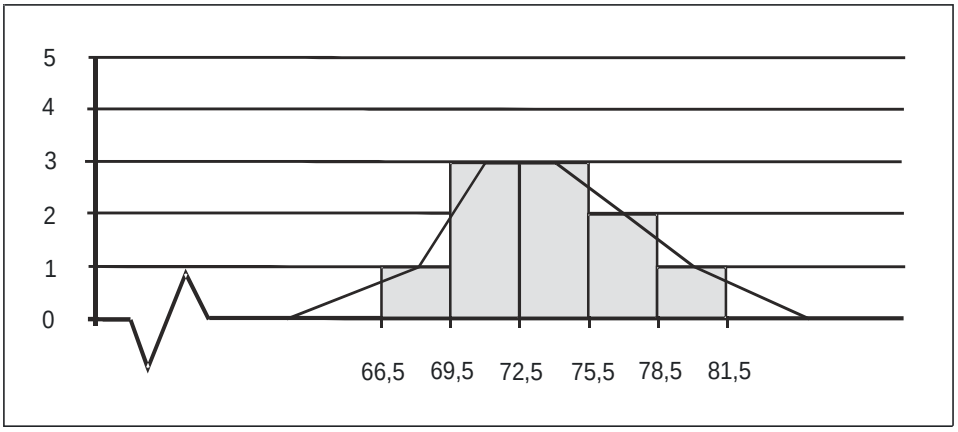
The students' scores are: 69, 70, 70, 72, 73, 75, 75, 77, 78, and 81.

The data description shows that the range of the scores is 12. The mean is 74. The mode is 75. The median is 74. And the standard deviation is 3.92. *(see appendix page 121)*

Table 5. Frequency distribution A_1 B_2.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
67 – 69	66.5 - 69.5	68		1	10%
70 – 72	69.5 - 72.5	71		3	30%
73 – 75	72.5 - 75.5	74		3	30%
76 – 78	75.5 - 78.5	77		2	20%
79 – 81	78.5 - 81.5	80		1	10%
				20	100%

Figure 6. The histogram and polygon of the students having low IQ taught using Mindmapping technique.



5. The scores of the students having high IQ who are taught using Modeling technique (A_2B_1)

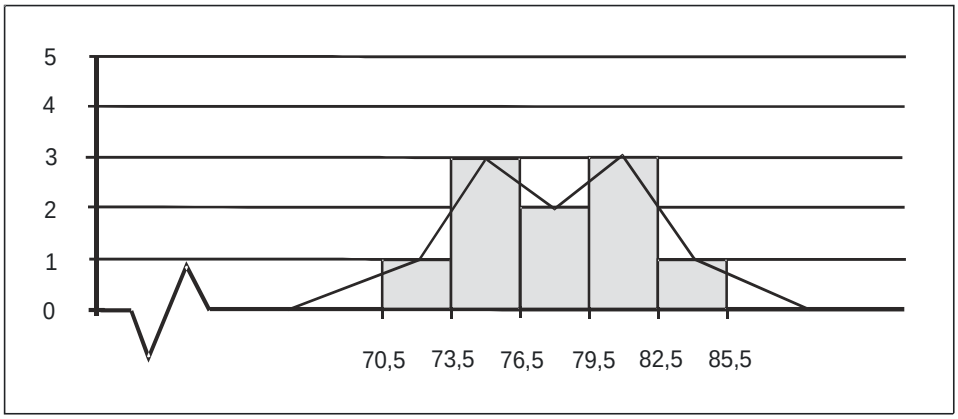
The students' scores are: 73, 75, 76, 76, 78, 79, 80, 80, 82, and 84.

The data description shows that the range of the scores is 11. The mean is 78.3. The mode is 76. The median is 78.5. And the standard deviation is 3.368. *(see appendix page 122)*

Table 6. Frequency distribution A_2 B_1.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
71 – 73	70.5 - 73.5	72		1	10%
74 – 76	73.5 - 76.5	75		3	30%
77 – 79	76.5 - 79.5	78		2	20%
80 – 82	79.5 - 82.5	81		3	30%
83 – 85	82.5 - 85.5	84		1	10%
				20	100%

Figure 7. The histogram and polygon of the students having high IQ taught using Modeling technique.



6. The scores of the students having low IQ who are taught using Modeling technique (A_2B_2)

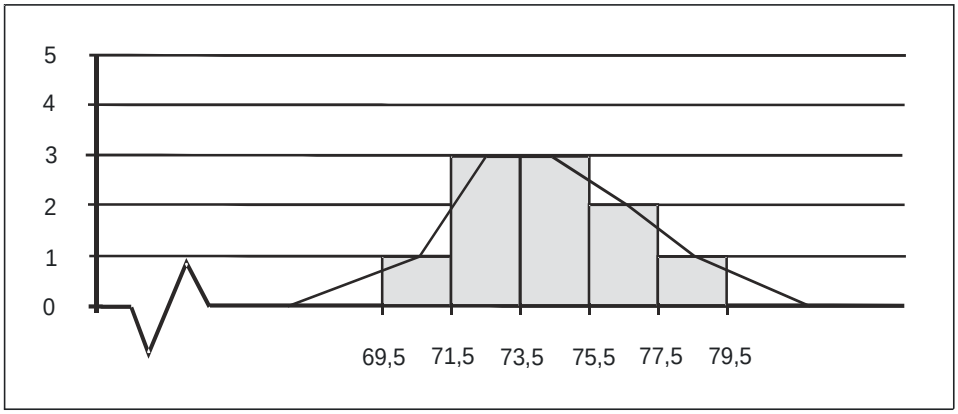
The students' scores are: 70, 72, 72, 73, 74, 74, 75, 77, 77, and 79.

The data description shows that the range of the scores is 9. The mean is 74.3. The mode is 74. The median is 74. And the standard deviation is 2.75. *(see appendix page 123)*

Table 7. Frequency distribution A_2 B_2.

Class Limit	Class Boundaries	Midpoint	Tally	Frequency	Percentage
70 – 71	69.5 - 71.5	70.5		1	10%
72 – 73	71.5 - 73.5	72.5		3	30%
74 – 75	73.5 - 75.5	74.5		3	30%
76 – 77	75.5 - 77.5	76.5		2	20%
78 – 79	77.5 - 79.5	78.5		1	10%
				20	100%

Figure 8. The histogram and polygon of the students having low IQ taught using Modeling technique.



Data Analysis

Normality

Before analyzing the data for testing the hypotheses, the researcher analyzes the normality and the homogeneity of the data. The following is

the summary of normality of the sample distribution. *(see appendix page 140)*

Table 8. The summary of the normality of the sample distribution.

Data	Number of Sample	Lo	Lt	Alpha	Distribution of Sample
A1	20	0.0857	0.1900	0.05	Normal
A2	20	0.1523	0.1900	0.05	Normal
A1B1	10	0.1315	0.2580	0.05	Normal
A1B2	10	0.1413	0.2580	0.05	Normal
A2B1	10	0.1794	0.2580	0.05	Normal
A2B2	10	0.2406	0.2580	0.05	Normal

Homogeneity

After analyzing the normality of the sample distribution, the researcher analyzes the homogeneity of the data. The following is the analysis of the data homogeneity. *(see appendix page 146)*

Table 9. Data homogeneity.

NO	X_1	X_2	X_3	X_4	X_1^2	X_2^2	X_3^2	X_4^2
1	88	81	82	79	7744	6561	6724	6241
2	90	78	84	77	8100	6084	7056	5929
3	82	75	76	75	6724	5625	5776	5625
4	85	73	80	74	7225	5329	6400	5476
5	84	77	75	74	7056	5929	5625	5476
6	80	75	80	72	6400	5625	6400	5184
7	86	70	73	73	7396	4900	5329	5329
8	87	69	79	77	7569	4761	6241	5929
9	83	72	78	72	6889	5184	6084	5184
10	78	70	76	70	6084	4900	5776	4900
∑	843	740	783	743	71187	54898	61411	55273

$\chi^2 = (\text{In}10)\{B-\sum(ni-1)\log si2\} = (2.3026)(38.7889-38.2662) = 1.204$

It shows that χ^2 is 1.204. Because χ_o^2 (1.204) is lower than $\chi_{t,\,95(3)}^2$ (7.81), it can be concluded that the data are homogeneous.

In order to gain a scientifically acceptable result of analysis, the analysis must be conducted systematically. The research data are then analyzed using ANOVA test and Tukey test. The analysis is meant to answer the following problems: (1) Is Mindmapping technique more effective than Modeling technique in teaching writing for the seventh grade students of SMPN 1 Prambon Nganjuk in the academic year 2009/2010?; (2) Is the achievement of the students having high IQ better than those having low IQ in learning English writing skill?; and (3) Is there an interaction between teaching techniques and students' IQ?

ANOVA test (Multifactor Analysis of Variance)

Before the data are analyzed using ANOVA test, the data are divided into four groups, they are: (1) A_1B_1 which is the data of the students having high IQ taught using Mindmapping technique, (2) A_1B_2, the data of the students having low IQ taught using Mindmapping technique, (3) A_2B_1, the data of the students having high IQ taught using Modeling technique, and (4) A_2B_2 is the data of the students having low IQ taught using Modeling technique.

Table 10. Multifactor Analysis of Variance

Techniques / Students IQ	Mindmapping Technique		Modeling Technique		
High IQ	78	**CELL 1**	73	**CELL 3**	
	83		75		
	80	**$\sum X = 843$**	76	**$\sum X = 783$**	**$\sum X_{r1} = 1626$**
	82		76		
	84	**$\overline{X} = 84.3$**	80	**$\overline{X} = 78.3$**	**$\overline{X}_{r1} = 81.3$**
	85		80		
	86		78		
	87		79		
	88		82		
	90		84		
Low IQ	69	**CELL 2**	70	**CELL 4**	
	70		74		
	70	**$\sum X = 740$**	72	**$\sum X = 743$**	**$\sum X_{r2} = 1483$**
	72		72		
	73	**$\overline{X} = 74$**	73	**$\overline{X} = 74.3$**	**$\overline{X}_{r2} = 74.15$**
	75		74		
	75		75		
	77		79		
	81		77		
	78		77		
TOTAL	**$\sum X_{c1} = 1583$**		**$\sum X_{c2} = 1526$**		**$\sum X_t = 3109$**
	$\overline{X}_{c1} = 79.15$		**$\overline{X}_{c2} = 76.3$**		**$\overline{X}_t = 77.725$**
					$\sum X_t^2 = 242769$

Table 11. The summary of a 2 x 2 multifactor analysis of variance

Source of variance	SS	df	MS	F_o	$F_{t(.05)}$	$F_{t(.01)}$
Between columns (Teaching Techniques)	81.225	1	81.225	6.7955	4.17	7.58
Between rows (IQ)	511.225	1	511.225	42.7704	4.17	7.58
Columns by rows (Interaction)	99.225	1	99.225	8.3014	4.17	7.58
Between groups Within groups	691.675 430.3	3 36	230.55833 11.952778			
Total	1121.975	39				

Tukey test

After using multifactor analysis of variance, the researcher analyzes the data using Tukey test. The following is the analysis of the data using Tukey test.

a. Mindmapping technique compared with Modeling technique

$$q = \frac{\overline{X}_{c1} - \overline{X}_{c2}}{\sqrt{ErrorVariance/n}} = \frac{79.15 - 76.3}{\sqrt{11.95278/20}} = \frac{2.85}{0.773071} = 3.686595$$

The computation illustrates that q_o (3.69) is higher than q_t (2.95).

b. Mindmapping technique compared with Modeling technique for students having high IQ

$$q = \frac{\overline{X}_{c1r1} - \overline{X}_{c2r1}}{\sqrt{ErrorVariance/n}} = \frac{84.3 - 78.3}{\sqrt{11.95278/10}} = \frac{6}{1.093288} = 5.488034$$

The computation illustrates that q_o (5.49) is higher than q_t (3.15).

c. Mindmapping technique compared with Modeling technique for students having low IQ

$$q = \frac{\overline{X}_{c2r2} - \overline{X}_{c1r2}}{\sqrt{ErrorVariance/n}} = \frac{74.3 - 74}{\sqrt{11.95278/10}} = \frac{0.3}{1.093288} = 0.274402$$

The computation illustrates that q_o (0.27) is lower than q_t (3.15).

Hypotheses verification

Based on the summary of a 2 x 2 Multifactor Analysis of Variance, it can be concluded that:

1. F_o between columns (6.7955) is higher than $F_{t(.05)}$ (4.08) and $F_{t(.01)}$ (7.31), so the difference between columns is significant. It can be concluded that teaching writing using Mindmapping technique to the seventh grade students at SMPN 1 Prambon is significantly different from the one using Modeling technique. The mean score of students taught using Mindmapping technique (79.15) is higher than the one of those taught using Modeling technique (76.3). It means that teaching writing using Mindmapping technique to the seventh grade students of SMPN 1 Prambon is more effective than the one using Modeling technique.

2. F_o between rows (42.7704) is higher than $F_{t(.05)}$ (4.08) and $F_{t(.01)}$ (7.31), so the difference between rows is significant. It can be concluded that students having high IQ demonstrate a significantly different result in their learning from the ones having low IQ. The mean score of students having high IQ (81.3) is higher than the one of those having low IQ (74.15). It means that the achievement of

teaching writing to the students having high IQ is better than the one to the students having low IQ.

3. F_o between rows (8.3014) is higher than $F_{t(.05)}$ (4.08) and $F_{t(.01)}$ (7.31), so it can be concluded that there is an interaction effect between the two variables, the teaching techniques and students' IQ. In this case, Mindmapping technique is more suitable for students with high IQ while modeling technique is more suitable for students with low IQ.

Based on the summary of Tukey test, it can be concluded that:

q_o between columns (3.69) is higher than q_t (2.95), so the difference between columns is significant. It can be concluded that teaching writing using Mindmapping technique to the seventh grade students at SMPN 1 Prambon is significantly different from the one using Modeling technique. The mean score of students taught using Mindmapping technique (79.15) is higher than the one of those taught using Modeling technique (76.3). It means that teaching writing using Mindmapping technique to the seventh grade students of SMPN 1 Prambon is more effective than the one using Modeling technique.

q_o between columns for students with high IQ (5.49) is higher than q_t (3.15), so the difference between columns for students with high IQ is significant. It can be concluded that teaching writing using Mindmapping technique to the seventh grade students having high IQ is significantly different from the one using Modeling technique. The mean score of students having high IQ taught using Mindmapping technique (84.3) is higher than the one of those taught using

Modeling technique (78.3). It means that teaching writing using Mindmapping technique to the seventh grade students having high IQ is more effective than the one using Modeling technique.

q_o (0.27) is lower than q_t (3.15), so the difference between columns for students with low IQ is not significant. It can be concluded that teaching writing using Mindmapping technique to the seventh grade students having low IQ is not significantly different from the one using Modeling technique. It means that students with low IQ will end up will "almost" the same result when they taught using both techniques, Mindmapping and Modeling.

Discussion of the Findings

This research is one of the efforts to generate some improvement in teaching writing to the seventh grade students of the junior high school students. It has been discussed in the previous chapter that Mindmapping technique is one of the alternatives to obtain the intention. The following is the elaboration discussions of the research findings.

There is significant difference between Mindmapping technique and Modeling technique for teaching writing.

Based on the findings of the study, the researcher draws a conclusion that the implementation of Mindmapping technique is effective to help in generating and organizing the ideas for writing texts. Writing is usually considered the most difficult skill of English to master. One of the major problems is how to generate ideas and how to organize the ideas well.

Heaton (1988: 135) states that writing skills are complex, requiring mastery not only of grammatical and rhetorical devices but also conceptual and judgmental elements. He also states that one of the many and varied skills necessary for good writing is treatment of content: the ability to think creatively and develop thoughts and excluding all irrelevant information. To overcome the problem, an outlining strategy in the form of Mindmapping is proposed to be applied in teaching writing. Hayes (1992: 203) states through mind mapping students turn random thoughts into patterns that can be written down and developed. Students become increasingly motivated to complete a writing task as their ideas emerge in organized form. Many students find writing difficult, and they find getting started the most difficult part of writing. Mind mapping reduces the difficulty by giving students an organizing strategy to get them started. In mind mapping, ideas are freely associated and written out without pressure, thus reducing tension and resistance often associated with writing.

The writing achievement of students with high IQ is better than the one of those with low IQ.

Students with high IQ tend to have better achievement concerning with all educational activities. Jordan (2006: 217) states that IQ is related to academic achievement; students with high IQs generally do well in school and those with low IQ scores tend to do poorly. Writing, specifically, has

several skills and some of them are hierarchical which means some skills must be mastered first before a student masters the other ones. Students with high IQ usually will find creative steps to overcome the problems. Jordan (2006: 215) implies that intelligence is closely associated with creativity. Therefore, they usually will come up with a certain strategy in dealing with a challenging subject matter. In addition, Aiken (1977: 169) states that children with high IQ have several characteristics, some of them are: inquisitive, creative, and strong willed, but also rebellious. That's why; they sometimes arise with an uncommon way out of a problem. They usually will be more encouraged to try harder when they face a challenging matter.

On the contrary, students with low IQ face problem with most of the academic processes. Jordan (2006: 219) states that students with low IQ usually have learning disabilities which refer to a number of disorders that may affect the acquisition, organization, retention, understanding and use of verbal or nonverbal information. In relation with writing, Jordan (2006: 219) states that learning disabilities may interfere with the acquisition and use of oral language, reading, written language and mathematics. She gives details that the written language problem is related with the spelling and written expression. So, students with low IQ will face great problems when they confront composition writing. The problem is not only great but also complex since before they can fully master the previous materials namely spelling and sentence writing, they have to face composition

writing. Considering Scrivener's (1994: 255) statement that writing work in the classroom falls on a continuum, the complexity arises because spelling and sentence writing are needed if they want to deal with composition writing. Without mastering the old one it is almost not possible to deal properly with the next materials. From other point of view, students with high IQ usually have certain learning strategy; therefore, they have prepared the stages on their own pace to deal with the materials. As a result, students with high IQ have better writing achievement than the ones having low IQ.

There is an interaction between teaching techniques and students IQ.

There is no doubt that teaching techniques as well as students IQ have a very important role in the success of teaching and learning process. In most cases, observing the students in all aspects is necessary before a teacher decides to apply a certain teaching technique in a classroom. IQ is one of the aspects that should be taken into consideration. Inquisitive is one of the characteristics of children with high IQ; so they always explore their surrounding and generates new ideas about things (Aiken, 1997: 169). Mindmapping technique is one of the best techniques to manage students with this characteristic. Hayes (1992:203) states that through mindmapping, students turn random thoughts into patterns that can be written down and developed. In other words, the prosperous ideas from the

students with high IQ can be managed and organized properly using mindmapping.

The other technique, modeling technique is less appropriate for students with high IQ. Kauchak (1989: 37) defines modeling as the tendency of an individual to behave in a way that imitates a behavior or attitude observed in others. Modeling technique less appropriate because students with high IQ tend to be creative and have new ideas rather than imitating or following others. Their other nature, rebellious, is also not so suitable with the imitative characteristic of the modeling technique.

Modeling technique is more suitable for students with low IQ. Considering the state of the learners, Kauchak (1989:40) states that the more uncertain the learner is the more significant will be the model's effect. Another point of view is that the imitative feature of modeling is inline with the need of low IQs students which is the need of guidance and plain examples/models (Aiken, 1997:166). In writing, modeling technique is done by providing to the students not only explicit example of the text type but also the generic structure of the text. By giving explicit examples of the same text type and similar generic structure several times, the students will acquire a fix structure of the text subconsciously. Therefore, the students will be able to be more focus on mechanical aspects of language such as spelling and punctuation, and also on grammar.

CHAPTER V

CONCLUSION, IMPLICATION, AND SUGGESTION

The discussion of the finding has been presented in the previous chapter. This chapter presents the conclusion, implication of the research, and suggestion for teachers, students, and other researchers based on the finding of the research discussed on the previous chapter.

Conclusion

It has been clearly described on the previous chapter that the research findings are as follows:

Mindmapping technique is more effective than Modeling technique to teach writing for the seventh grade students of SMPN 1 Prambon Nganjuk in 2009/2010 academic year.

The writing achievement of the seventh grade students of SMPN 1 Prambon Nganjuk in 2009/2010 academic year having high IQ is better than those having low IQ.

There is an interaction between teaching techniques and students' IQ in teaching writing for the seventh grade students of SMPN 1 Prambon Nganjuk. Mindmapping technique is clearly more suitable for students with high IQ while modeling is suitable for students with low IQ.

Based on the research findings, the conclusion is that the Mindmapping technique is an effective teaching technique for teaching writing to the seventh grade students of SMPN 1 Prambon Nganjuk. Since Mindmapping technique is simple, fun, and arousing students' creativity in generating and organizing their ideas, students are getting more active and more encouraged to study writing and improved their writing skills. As a result, the students' writing achievement is improved optimally.

Implication

Many students find writing difficult, and they find getting started the most difficult part of writing. Mindmapping reduces the difficulty by giving students an organizing strategy to get them started. In mindmapping, ideas are freely associated and written out without pressure, thereby reducing tension and resistance often associated with writing. Although, it is one type of outlining methods, the product of the prewriting activity using mindmapping is notably different from the one using other type of outlining. Unlike conventional outlining, the product of prewriting activity using mindmapping does not follow a rigid fixed linear. In outlining, ideas must be arranged sequentially which is contradictory with the natural way of how brain works, because brain works in a non linear way. The elements of a given mind map are arranged intuitively according to the importance of the concepts, and are classified into groupings, branches, or areas, with the goal of representing semantic or other connections

between portions of information. Mindmapping also aid recall of existing memories.

Mindmapping may be used effectively with students beyond primary grades and in any class that requires writing. It is obviously appropriate for language classes. It is applicable for large groups. Teaching students how to use mindmapping takes about 10 minutes of demonstration time.

The procedure is as follows: the teacher begins by writing a nucleus word or phrase (topic/theme) at the centre of the chalkboard and circles it; then asks the students to concentrate on the topic; after two minutes, asks the students one by one to write any words or phrases related to the topic; teacher makes the point that other words and phrases are to be associated with the nucleus word/phrase, and with other words and phrases; teacher may demonstrates free association by saying aloud words and phrases that come to mind and jotting them down rapidly; these words and phrases are all circled and connecting lines are drawn to show how they are associated.

The procedure above is used to introduce the basic design of mindmapping and its application to the students. The steps are used to help the students analyze the ideas and represent them visually. The students will gradually be accustomed to use mindmapping to communicate their ideas. On the next meetings, the students are asked to use the diagram as a basis to construct a written product/text.

As a matter of fact, mindmapping is not only useful to help students writing a complex composition of a certain type text. It can help with almost any types of texts. It even helps students to draw a grammatical schematic. It also does not

merely have to use words and phrases but also pictures, charts, or anything as long as they representing what students have in mind.

In the process of writing, the role of mindmapping can be described as follows:

1. to arouse motivation to write: after finding a topic, students can start from anywhere and does not have to be afraid of making mistakes;
2. to get ideas gathered: by jotting down anything come up in their mind they get ideas together as well;
3. planning and outlining: by drawing the associative lines the can plan their future composition and it is also possible for them to directly give numbers or other signs on the lines or words;
4. making notes: from the mindmap, the students can choose then sketch the figure of their composition;
5. making a first draft: the students can use the notes from the previous step or they can directly compose a draft based on the mindmap;
6. revising, replanning, redrafting: they can easily put side by side their draft and their mindmap, then adding or omitting part of the draft, and even rearranging the draft;
7. editing and getting ready for a final product: the revised draft can once again be put side by side with the mindmap to check, choose and select which one should be omitted, added, rearranged to obtain the final product.

Suggestion

Some suggestions for teachers, students, and future researchers can be listed as follows:

For the teachers

Correct choice of teaching technique can make the teaching and learning process not only run well but also interesting and enjoyable. Enjoyable teaching and learning activities will help students receive the material more effectively and efficiently; it will also makes the teacher more focus on the necessary things needed for the class. Mindmapping technique is a technique which will lead students to be more independent; thus it is good to be applied in small classes as well as the big ones. It is simple, fun and arousing creativity. That's why, it is recommended for teacher to apply it in their class.

For the students

Mindmapping is a simple technique which can be used for writing activities. It is not only helpful in teaching and learning process in the classroom. Mindmapping is also useful in other writing activities to generate and organize ideas, opinion and thoughts. So, the researcher suggests that all students learn how to use it.

For the future researchers

A similar research with different population characteristic is also promising.

A replication of this research design using mindmapping as teaching technique as the treatment for teaching writing can be done with some alteration.

It possibly also useful to have research with different students' condition like students' habit, motivation, or interest.

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